

**Figure 1: Genomic constitution of certain Brassica species (U, 1935).  
Amphidiploids listed in bold text**

Brassica rapa		
Diploid		
Genome - AA		
<b>Brassica napus</b>	<b>Brassica juncea</b>	
<b>Amphidiploid</b>	<b>Amphidiploid</b>	
<b>Genome - AACC</b>	<b>Genome - AABB</b>	
Brassica oleraceae		Brassica nigra
Diploid		Diploid
Genome - CC		Genome - BB
	<b>Brassica carinata</b>	
	<b>Amphidiploid</b>	
	<b>Genome - BBCC</b>	

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**Figure 2: Breeding procedure used to develop herbicide tolerant**

**Brassica juncea**

Females	Male
Bulk population from 16 Brassica juncea breeding lines low glucosinolate (9-18 umoles) low erucic acid (<1%)	46A72
Crossed to produce the F1	
Female	Males
F1 from previous cross 13 F1 lines x 15 plants per line Selected with Pursuit® 50ml/ha a.i. Chose resistant plants for crossing	Bulk pollen from 16 breeding lines – F5 to F8 generation low glucosinolate (<8 um) low erucic acid (< 0.5%)
Crossed to produce BC1	
Female	Males
BC1 populations from previous cross 6 BC1 populations x 36 plants per line Selected with Pursuit® - 50 ml/ha a.i. Chose resistant plants for crossing	Bulk pollen from 16 breeding lines – F5 to F8 generation low glucosinolate (<8 umoles) low erucic acid (<0.5%)
Crossed to produce BC2	
Female	Males
BC2 seed from previous cross 4 BC populations Selected with Pursuit® – 50 ml /ha a.i. Chose resistant plants for crossing	Bulk pollen from 3 breeding lines – F6 generation low glucosinolate (6 to 12 umoles) low erucic acid (<0.5%)
Crossed to produce BC3	
Stable juncea phenotype combined with Pursuit® tolerance Lines coded: 98SJ-23841, 98SJ-23844, 98SJ-23845	

**Figure 3: Greenhouse and field evaluation of Herbicide tolerant  
Brassica juncea populations**

**Greenhouse evaluation 1 – verify tolerance and juncea phenotype**

98SJ-23841, 98SJ-23844, 98SJ-23845 and unstable BC3 sister lines planted for herbicide tolerance evaluation

Pursuit® applied at 50 ml/ha a.i.; juncea phenotype stable

Survivors self pollinated and harvested

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**Greenhouse evaluation 2 – verify tolerance and juncea phenotype**

Survivors from previous project planted for herbicide tolerance evaluation

Pursuit® applied at 50 ml/ha a.i.; juncea phenotype and tolerance stable in 98SJ-23841, 98SJ-23844 and 98SJ-23845

Survivors self pollinated and harvested

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**Field evaluation 1 – verify tolerance and juncea phenotype under field conditions**

Pioneer Hi-Bred International Puerto Vallarta Mexico Research Station

Self-pollinated selections from all other previous projects were planted at a single location

Odyssey® was applied at 30g/ha a.i.

Juncea phenotype stable – tolerance present in 98SJ-23841, 98SJ-23844 and 98SJ-23845 progenies

Other material derived from other generations and breeding lines exhibited a range of tolerance ranging from fully resistant, intermediate resistant and susceptible. Plant phenotypes ranged from full Brassica napus to Brassica juncea phenotypes and lines and populations that exhibited traits that were intermediate between Brassica napus and Brassica juncea. In these other materials, full resistance to the herbicide was not associated with the juncea phenotype, and vice-versa.